



Marine protected areas in the 21st century: Current situation and trends

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ABSTRACT

In recent years, the environmental crisis affecting the planet has caused the deterioration of the oceans and a great loss of biodiversity. In response to these changes, the quantity and extension of coastal and marine protected areas (MPAs) has increased, highlighting protection as one of the most effective instruments to conserve biodiversity and its resources. In this study the evolution to the current standing of MPAs within the international framework has been analysed, utilising information extracted from the United Nations databases and the study of specific cases. For this purpose, the planet has been divided into eight regions (according to the United Nations) and two MPAs have been evaluated within each region, reported in different periods. The results provide a view of changes to the management of MPAs since their consolidation, as well as current approaches and challenges. Since the beginning of this century, the criteria used to establish MPAs have been unified throughout the planet. However, the planning and management of these spaces differs between various regions. Three main achievements have been identified since the last decade: 1) There is a tendency towards the implementation of an ecosystem approach, widely extended in both the terrestrial and marine environment, which gives greater importance to the maintenance of ecosystem services; 2) It is recognised that MPAs are an effective instrument to mitigate the effects of climate change; 3) To achieve effective protection, it is recommended that MPAs are established beyond waters under national jurisdiction, which is where the majority are concentrated today. Notably, despite international recommendations and the efforts made by governments and institutions, the oceans remain one of the ecosystems most affected by the development of human activities.

1. Introduction

In recent years, the environmental crisis affecting the planet has caused the deterioration of ecosystems and a great loss of biodiversity and habitats. Coastal-marine zones are especially vulnerable to this degradation as human activities are increasingly concentrated on the coast and exert great pressure on these ecosystems, severely affecting them. In addition, the contact between lithosphere, hydrosphere and atmosphere, results in phenomena that converge here as being especially interesting from a physical-natural, socio-economic and juridical-administrative point of view, and require particular treatment and consideration, especially with regard to spatial planning and management (Barragán, 2014).

In response to these changes, there has been a rapid increase in the number and extension of protected areas on a global scale over the last 20 years, which values protection as one of the most effective instruments for conserving biodiversity and resources, as well as reducing human impact (Cifuentes et al., 2000). Since 1872, when Yellowstone (Wyoming, USA) was designated as the first National Park in the world, the approach for the

management of protected areas has evolved. One of management models that prevails today is that of an ecosystem approach, which promotes conservation and sustainable use in an equitable manner (Lester et al., 2010).

The first protected areas that included a coastal-marine component appeared later. According to Salm and Clark (1984), these were Everglades National Park (1934) and Fort Jefferson-Dry Tortugas National Park (1935), both in Florida (USA). The delay of Coastal-Marine Protected Areas (MPAs) in comparison to terrestrial ones could be justified, due to a lack of knowledge of the marine environment at that time and the belief that its resources were unlimited (Patillo, 1997), among other reasons. The first MPAs were often small marine extensions of protected terrestrial spaces, which were usually included to allow for the demarcation of the area, for example, a bay (Gubbay, 1995; Salm and Clark, 1984). However, the increase in the MPAs was established years later. In the 50s and 60s, due to industrial and technological developments, oceans became subject to large-scale exploitation, and scientific studies soon demonstrated their deterioration. The ecological importance of coastal and marine habitats was highlighted, prompting the need to develop

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management and protection plans for these ecosystems (Board, 2001).

In 1956, the United Nations convened the First Conference on the Law of the Sea in Geneva (Switzerland), which concluded in 1958. Four treaties were adopted with the aim of developing a legal framework to establish sovereign and jurisdictional rights of States: the High Seas, the Continental Shelf, the Territorial Sea and Contiguous Zone, and the Fishing and Conservation of Living Resources of the High Seas (Board, 2001; Kelleher and Kenchington, 1992). In 1959, the twelve states¹ that had carried out scientific activities in and around the Antarctica during the International Geophysical Year (from July 1957 to December 1958) signed the Antarctic Treaty, with the aim of protecting this continent (Dodds, 2009). It was in 1962 that special attention was given to coastal and marine ecosystems (Board, 2001; IUCN, 1994; Ramos Esplá et al., 2004; Salm and Clark, 1984). In this same year the First World Parks Congress, organised by IUCN, was held in Seattle (USA), and coastal countries were recommended to examine the need to establish marine parks for the protection of rare species, the restoration of habitats and research (Ortiz, 2000; Ramos Esplá et al., 2004).

From the 70s onwards, recognition and concern for marine environmental problems increased, and several documents emerged as the result of international treaties and congresses. These include, among others, the Ramsar Convention, adopted in 1971, with the objective of preventing the degradation and disappearance of wetlands, and the World Heritage Convention, adopted in 1972 (Gubbay, 1995; Kelleher and Kenchington, 1992; Salm and Clark, 1984). In 1972, the United States approved its current coastal law, the Coastal Zone Management Act, a milestone for the management of the MPAs around the world. This is considered an important antecedent of the current Integrated Coastal Zone Management (ICZM) (Barragán, 2014, 2004; Kay and Alder, 1999; Salm and Clark, 1984). That same year the First United Nations Conference on Human Environment in the same Biosphere was held in Stockholm (Sweden). From this Conference, the Regional Seas Programme was created in 1974, which highlighted the need to intensify cooperation and collaboration between neighbouring states and international organisations (Carreño, 1999; Kelleher and Kenchington, 1992; Ramos Esplá et al., 2004). Thirteen agreements or plans of action were developed, with special emphasis on the protection of marine living resources from pollution and over-exploitation. In 1975, the first of these came into force, referring to the Mediterranean Sea. Currently there are 18 agreements in place.

The first specific conference of MPA was promoted by the IUCN and took place in Tokyo (Japan), in 1975. A surge in the pressure on marine ecosystems had been detected which led to the suggestion to establish a MPA monitoring system for the world's marine ecosystems (Board, 2001; Kelleher and Kenchington, 1992; Ortiz, 2000).

Awareness of the fragility and importance of coastal areas led to the approval of the European Coastal Charter prepared at the Conference of Peripheral Maritime Regions of the then European Economic Community in 1981. Its main objective was cooperation and coordination between the various administrations with coastal responsibilities to foster an integrated approach for uses and protection of the coast (Martín García, 2010). Between 1973 and 1982, the Third United Nations Conference on the Law of the Sea was held, from which emerged the United Nations Convention on the Law of the Sea, the treaty that regulates international marine law. It provided a legal basis for measures to establish MPAs, recognising that biodiversity of the marine environment is an integral part of world heritage - both within the jurisdictional coastal areas of the States (which usually extends to 200 nautical miles above the baseline) and on the high seas (Board, 2001; Kelleher and Kenchington, 1992; Salm and Clark, 1984).

Beginning in the 1990s, innovative instruments for planning and management began to emerge, and ICZM programmes appeared. These reached international recognition, and many countries began to develop their own initiatives (Barragán, 2014). In 1992 the World Conference on Sustainable Development or the Earth Summit was held in Rio de Janeiro (Brazil), where

the concept of sustainable development linked to nature gained worldwide traction (Tolón and Lastra, 2008). During this conference, the binding Convention on Biological Diversity (CBD) was signed, establishing a series of measures to achieve a fair and equitable sharing of the benefits derived from the biodiversity contained within the marine environment. In 1995, the Conference of the Parties to the CBD approved the Jakarta Mandate on Biological Diversity of the Seas, a global consensus on the importance of marine and coastal diversity. It includes five thematic areas: integrated marine and coastal area management; marine and coastal protected areas; sustainable use of marine and coastal living resources; mariculture; and alien species (Goote, 1997). The year 1998 was designated as the International Year of the Oceans by the United Nations, as a measure to heighten recognition of the importance of the oceans in sustainable development (UNESCO, 1998).

As of 2000, ecosystem-based management gained strength, promoting conservation and sustainable use in an equitable manner. In this same year the United Nations approved the *Millennium Declaration*, a new global alliance with the objective of reducing extreme poverty levels. The Secretary General of the UN at that time, Kofi Annan, facilitated the international scientific programme - *Evaluation of Millennium Ecosystems (MA)*. This initiative was a great innovation and concluded that changes to ecosystems have helped improve human wellbeing and economic development, but at a large environmental and social cost (MA, 2005). It identified the crisis of the coastal-marine ecosystems, which were those in the worst condition.

In 2002 a new Earth Summit in Johannesburg (South Africa) took place under the name *Conference on Sustainable Development*. Its Plan of Action promoted the adoption of measures at all levels for the ocean conservation and management, including the creation of marine protected areas (MPAs) and the establishment of networks (United Nations, 2002).

In 2003, the *Fifth World Parks Congress* was held in Durban (South Africa), in which special attention was given to MPAs. Its role in the conservation of biodiversity and sustainable development was highlighted, and concern was expressed for the limited coastal-marine protected area (1% compared to 12% terrestrial) (Castro, 2003). It was also recognised that ICZM was closely related to protected areas (Chica, 2005).

In 2010, the *Tenth Conference of the Parties of the CBD* was held in Nagoya (Japan), where the *Strategic Plan for Biodiversity 2011–2020*, with its *Aichi Targets*, was approved. These 20 targets, grouped into five specific objectives, to be reached by 2020, go beyond mere biological protection and address aspects of sustainable development (Hill et al., 2016). Target 10, included in Objective B,² states that “By 2015 the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning” and Target 11, included in Objective C,³ states that “by 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes”.

In 2012, the *United Nations Conference on Sustainable Development (Rio + 20)* took place in Rio de Janeiro (Brazil). The decision was made to develop and approve a series of *Sustainable Development Goals (SDGs)*, which were laid out at the *United Nations Summit on Sustainable Development* held in 2015 in New York (USA). The *Transforming our World: the 2030 Agenda for Sustainable Development: the 2030 Agenda for Sustainable Development* was adopted at that Summit. Goal 14 refers to the marine environment (“Conserve and sustainably use the oceans, seas and marine resources”), and provides a framework to protect and manage coastal-marine ecosystems in a sustainable manner.

In 2014, the *Sixth World Parks Congress* was held in Sydney, Australia, confirming that the marine environment remains one of the least protected ecosystems, while human impact continues to increase. There was strong

² Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use (www.cbd.int/doc/strategic-plan/2011-2020/Aichi-Targets-EN.pdf).

³ Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity (UNEP-WCMC and IUCN, 2016).

¹ The governments of Argentina, Belgium, France, Japan, New Zealand, Norway, South Africa, the USSR, the United Kingdom, Northern Ireland and the United States (Dodds, 2009).

support for MPAs as a tool to conserve the ocean, maintain and restore the planet's natural capital and climate stability. A number of recommendations and approaches to effectively address marine environmental conservation were presented, including increasing the area of effectively managed MPAs included in well-connected networks to 30% by 2030. From this congress, the role of protected areas as an effective measure to combat climate change was consolidated.

Although the changes in the management of protected natural spaces have been evaluated (Etxano, 2012; Ortiz, 2000; Tolón and Lastra, 2008), we do not find any revision that refers exclusively to the marine environment, nor analysis of what is currently occurring in MPAs of the world. Due to the importance and uniqueness of these ecosystems it has been considered of interest to carry out this study under the following hypotheses:

- There has been a paradigm shift in the management of MPAs at the international level. This evolution should facilitate increasingly sustainable management compatible with socioeconomic development, without harming ecosystems. However, progress is often reflected in institutions or international organisations and academia, while practical application tends to lag behind.
- The reasons that lead to the declaration of MPAs have evolved in recent years. Currently, conservation and socioeconomic criteria are being unified in different regions of the world, being guided by the same international guidelines.
- Since the beginning of the 21st century, most advanced countries spend a greater amount of resources on establishing and managing protected areas, however, in developing countries there are other priorities for human well-being. This means that in the most advanced countries there is a greater number of MPAs, as well as a greater amount of management resources.

The aim of this investigation is to analyse the evolution of current trends in the management of MPAs within the international framework. To that end, three specific objectives are proposed:

- Analyse the current situation of the MPAs within the international framework.
- Determine if there are differences in the declaration of MPAs across different regions of the world.
- Assess the progress made in the management of MPAs since the beginning of the 21st century.

2. Methodology

The research began with an extensive review of the literature to learn about the most important milestones in the protection of the marine environment. The period studied ranges from the creation of the first National Park to the present.

The methodological scheme followed has been as follows:

- 1) Information has been extracted from the UNEP-WCMC database on the evolution and current status of MPAs within an international framework.
- 2) The planet has been divided into eight regions, according to the proposals made by the United Nations in its database (United Nations Statistics Division, 2017). They are the following:
 - Australia and New Zealand (AusNZ)
 - Oceania (except Australia and New Zealand) (O)
 - North America and Europe (NAEu)
 - Latin America and the Caribbean (LatC)
 - East and Southeast Asia (ESEAs)
 - Central and South Asia (CSAs)
 - West Asia and North Africa (WASNAF)
 - Sub-Saharan Africa (SubAf)
- 3) For each of the regions, information has been extracted from the United Nations Statistical Division on the surface area of MPAs and the

percentage of their waters under protected national jurisdiction. The information corresponds to four dates: 2000, 2005, 2010 and 2016.

- 4) Two MPAs have been selected for the eight regions, one declared before 2005 and the other after 2010. The criteria for selecting the MPAs was the year of declaration.
- 5) In addition, for LatC, two MPAs declared before 2005 were selected instead of one. Both belong to the Eastern Pacific Marine Corridor, an area of great biological richness, so they have similar characteristics and should have significant connectivity.
- 6) In those documents that have a management plan, the reasons that led to the declaration of the MPA and its management objectives have been identified, and a comparison has been made between the different regions of the world.
- 7) After the analysis of the data, progress that has been made in the management of MPAs during the 21st century have been identified and evaluated.

The sources of information have been classified into three groups:

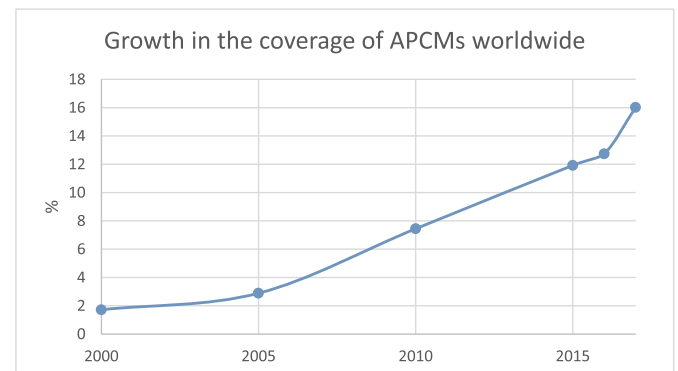
- a) Bibliographic: this type corresponds to scientific journals, publications, manuals, reports, official documents, doctoral theses and research projects.
- b) Web pages of international organisations or public institutions: the most relevant ones have been selected for the protection of ecosystems, based on their publications in congresses and international meetings. Among others, the United Nations Environment Programme (UNEP) and the International Union for the Conservation of Nature (IUCN) stand out.
- c) Databases: information has been extracted from the World Database on Protected Areas (WDPA) managed by the United Nations Environment Programme (UNEP) - World Conservation Monitoring Center (WCMC), through its [ProtectedPlanet.net](https://protectedplanet.net) interface, and the database of the United Nations Statistical Division.

3. Results and discussion

3.1. Current status of MPAs within an international framework

Both the number of MPAs and size of protected areas have increased worldwide in recent decades. The number of countries that protect their coastal-marine areas has also increased, which demonstrates that MPAs are an instrument that is increasingly used by governments (Etxano, 2012). Since 2000, the coverage of MPAs has grown more than 14% (Graph 1). Currently, there are 15 334 MPAs, covering almost 27 million km², which represents 7.44% of the world ocean and 17.3% of areas under national jurisdiction (UNEP-WCMC and IUCN, 2018).

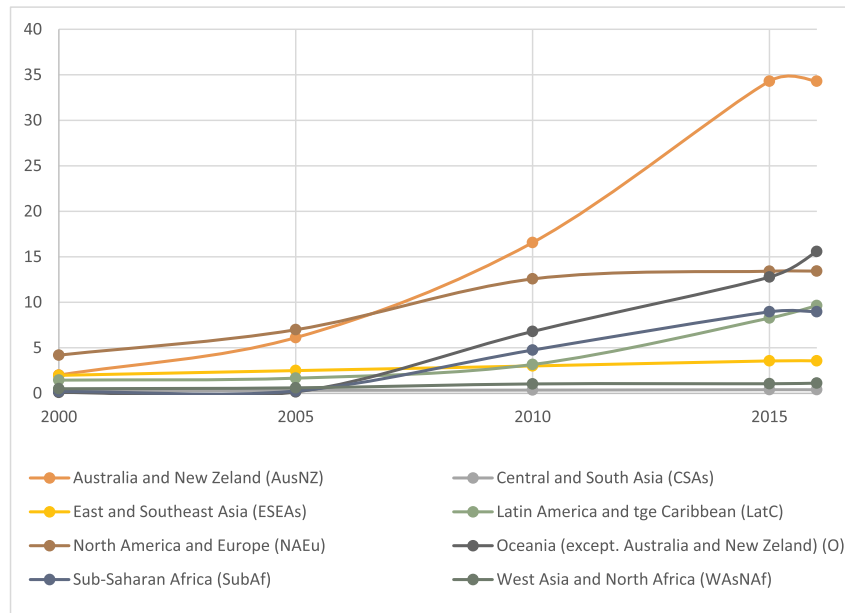
Much of the growth in the surface areas of MPAs can be accounted for by a small number of countries, which have established large marine protected areas. For example, the USA, France and the United Kingdom, and their overseas territories, contribute 50% of the total area covered by



Graph 1. Evolution over time of the percentage of MPAs in waters under national jurisdiction worldwide. Source: United Nations Statistics Division (2017).

Table 1
The 10 largest marine protected areas in the world. Source: UNEP-WCMC and IUCN (2018).

Protected Marine Area	Region	Year of declaration	Surface (km ²)
Region of the Ross Sea (ABNJ)	ABNJ	2017	2 060 058
Marae Moana: Cook Islands Marine Park (Cook Islands)	O	2017	1 982 029
National Reserve of the French Southern Lands (France)	NAEu	2016	1 655 001
Papahānaumokuākea National Marine Monument (USA)	NAEu	2006	1 516 555
Natural Park of the Coral Sea (New Caledonia, France)	NAEu	2014	1 291 643
United States Minor Outlying Islands of the Pacific (USA)	NAEu	2009	1 277 784
South Georgia and the South Sandwich Islands (The United Kingdom)	NAEu	2012	1 069 872
Coral Sea (Australia)	AusNZ	2012	995 261
Steller Sea Lion Protection Areas (USA)	NAEu	2002	866 717
Pitcairn Islands Marine Reserve (The United Kingdom)	NAEu	2016	839 568



Graph 2. Evolution of the coverage of MPAs over time, as a percentage of different regions of the world. Source: Prepared by the authors using data from the United Nations Statistics Division (2017).

MPAs, while Australia, the Cook Islands, New Zealand and Mexico account for 30% (UNEP-WCMC and IUCN, 2018a,b). The most developed countries are located in two regions, NAEu and AusNZ, where, correspondingly most protection of oceans takes place. The 20 largest MPAs in the world cover 70% of the protected area. Table 1 shows the first 10 by size, which account for 54% of the marine protected space. Large Marine Protected Areas (LMPAs) cover much of the range of migratory species, giving them more protection than smaller MPAs. In addition, due to its large size, it can include several biologically connected ecosystems in the same management area. However, they have some drawbacks, such as they may be more difficult to manage due to their large size and remote location (Wilhelm et al., 2014).

Although the data reflects progress towards the conservation of biodiversity and its resources, protection is still focused on national waters, protected areas in areas beyond national jurisdiction (ABNJ) have barely increased during this period. Only 1.18% of the waters in this area are preserved, even though they represent 61% of the global surface of the ocean (UNEP-WCMC and IUCN, 2018). This difference within national waters is justified, in part, by the delay in exploitation of the open sea with respect to coastal zones and the continental shelf (Merrie et al., 2014), in addition to the fact that no state has political or legal authority of protection in this area (Matz-Lück and Fuchs, 2014). The declaration of MPAs in ABNJ involves great challenges, such as conflicts between conservation and the freedom to exploit resources, as well as the fact that there is still a lack of knowledge of the ecosystems of the high seas and their management needs. Despite this, an LMPA has recently been declared in the Ross Sea, which covers an area of approximately 2 million km², making it the

largest in the world (Table 1), and it is almost entirely a no-take zone (approximately 72%). However, the mere designation of MPAs is not an indicator of success in ocean protection, since many of them lack adequate management.

As Graph 2 demonstrates that no region protected more than 5% of their national waters at the beginning of the 21st century. NAEu is the area with the highest coverage, 4.19%, while, O barely had a 0.09% of its national waters preserved, SubAf had 0.2% and CSAs had 0.27%.

NAEu was also the region that protected the largest area, 1.4 million km² (United Nations Statistics Division, 2017). The rest of the regions protected less than one million km², with CSAs contributing the smallest area, 12 407.4 km² (United Nations Statistics Division, 2017).

Until recently, despite numerous international recommendations, it was not normal conservation practice to declare MPAs in the marine environment. Which meant it was far from reaching the same levels of protection enjoyed by terrestrial areas. Most of which were established in areas adjacent to the coast, where biological wealth is greater along with impacts and anthropogenic pressures (Ortiz, 2000).

In 2016, the region that protected a higher percentage is, by far, AusNZ, with 34.3% of its national waters under the protection of MPAs. This increase is the result of the creation, in 2012, of 40 new MPAs, totaling 2.3 million km², making the Australian MPA network one of the largest in the world, with a total of 3.1 million km² (Grech et al., 2014), behind only to the USA.

The following regions with the largest protected area are O and NAEu, with 15.58% and 13.43% respectively. The USA is the country that contributes the greatest extension of MPAs to the region, with more than 3.5

Table 2

Examples of MPAs declared before 2005 in the different regions of the planet, reasons for declaration and conservation aims.

Reasons for declaration	Conservation aims	Management plans
Australia (AusNZ): Natural Park of the Great Barrier Reef (1975) (Authority, 1975)		
To ensure long-term protection and conservation of the environment, biodiversity and heritage of the Great Barrier Reef region	<ul style="list-style-type: none"> - To ensure the reduction or elimination of threats to the Park. - To ensure management for recovery, and continuous protection and conservation of species and ecological communities. - To ensure that the activities in the Park are ecologically sustainable. - To provide a basis for management of the uses in particular areas that may generate conflicts with other activities or values of the area. - To provide management in conjunction with communities in matters where they have a special interest. - To allow the population to use the Park and participate in a wide range of recreational activities. 	Currently there is a management plan for each of the four zones:- Cairns: 2008 - (in vigour) - Hinchinbrook: 2004 - (in vigour) - Shoalwater Bay: 1997 - (in vigour) - Whitsundays: 1998 and 2017 - (in vigour)
Northern Mariana Islands (O): Mañagaha Marine Conservation Area (2000) (Schroer, 2005)		
To protect and preserve the land and aquatic resources, flora, fauna and marine life for the enjoyment of future generations of residents and visitors.	<ul style="list-style-type: none"> - To dedicate personnel and material resources to implement the plan and ensure its regulation. - To monitor natural, cultural and historical resources, and uses made by visitors. - To inform and educate visitors about the conservation of resources, regulations and the potential impacts of their uses of resources. - To annually evaluate the effectiveness of management and regulation. 	2005 - (in vigour)
Spain (NAEu): Natural Park of the Strait (2003) (CMA, 2003 and 2007)		
To protect and preserve the land and aquatic resources, flora, fauna and marine life for the enjoyment of future generations of residents and visitors.	Summarised as: <ul style="list-style-type: none"> - To conserve ecological processes, landscapes and biodiversity, and protect them from anthropogenic threats. - The sustainable use of resources, taking into account socio-economic interests. - To guarantee educational, cultural and scientific content. 	- PORN has indefinite duration - it has not been modified so far. - PRUG.
Ecuador (LatC): Galapagos National Park (NP) (1959) and Galapagos Marine Reserve (MR) (1998) (Dirección del Parque Nacional Galapagos, 1999)		
To conserve the unique biodiversity of Galapagos	<ul style="list-style-type: none"> - To reaffirm the sovereignty over the maritime and terrestrial zone of the archipelago (NP). - To conserve and rehabilitate existing natural wealth (NP). - To preserve the NP as a natural laboratory and source of scientific research, oriented to the cultural enrichment of the country. - To proceed towards the economic, social and cultural integration of the province with the rest of the country (NP). - To protect and conserve the coastal-marine ecosystems of the archipelago and its biological diversity for the benefit of humanity, local populations, science and education (MR). 	NP: 1974, 1984, 1996, 2005 y 2014 (in vigour) MR: 1992 (was not implemented), 1999 y 2014 (in vigour)
Costa Rica (LatC): Cocos Island National Park (1978) (Ministerio del Ambiente y Energía, 2007)		
To conserve the biological richness	<ul style="list-style-type: none"> - To conserve samples of terrestrial and marine ecosystems representative of the eastern Pacific. - Maintain natural evolutionary processes. - To conserve genetic resources, flora and fauna species (marine and terrestrial) outstanding, endemic and in danger of extinction. - To protect the water resource. - To provide opportunities for scientific research and technical studies. 	2004, 2007 (in vigour)
Indonesia (ESEAs): Komodo National Park (1980) (Komodo National Park's Authority, 2000)		
To conserve the Komodo dragon and its habitats	<ul style="list-style-type: none"> - To fully protect natural communities, species and terrestrial, coastal and marine ecosystems. - To ensure long-term survival of the Komodo dragon and the quality of its habitat. - To create a sustainable use of Park resources for tourism, education and research. - To protect the reserves of corals and exploited fish. 	2000 (in vigour)
India (CSAs): Kutch Gulf National Park (1982) (Forests and Environment Department, 2009)		
To protect the coral and mangrove ecosystem, fauna and flora from human threats.	<ul style="list-style-type: none"> - To increase mangrove coverage - To enrich marine biodiversity. - To develop sustainable development programmes for the villages adjacent to the coastal area and increase the participation of society. - To facilitate sustainable tourism. - To increase the capacity of National Park staff and other interested parties. - To increase the sensitivity of the population of Gujarat to conservation of the ecosystem. 	2009 (in vigour).
Egipto (WAsNAf): Ras Mohamed National Park (1983) (Paleczny et al., 2007)		
Protection and sustainable management of marine resources	<ul style="list-style-type: none"> - To protect ecosystems retain their ecological functions. - To protect historical and cultural resources. 	No data

(continued on next page)

Table 2 (continued)

Reasons for declaration	Conservation aims	Management plans
	<ul style="list-style-type: none"> - To provide sustainable and compatible opportunities to explore the natural ecosystem and provide associated economic benefits, while prioritising the protection of ecosystems. - To provide opportunities for the people of Egypt and visitors to learn about the natural and cultural values of the park. - To monitor, investigate and support the evaluation of management effectiveness and the provision of economic benefits. 	
Sudáfrica (SubAf): West Coast National Park (1985) (SANParks, 2008)		
To protect the key conservation areas of the Langebaan lagoon and the associated wetlands, as well as the islands in Saldanha Bay	<ul style="list-style-type: none"> - To protect biodiversity in areas of national or international importance, landscapes and cultural heritage sites. - To prevent unconscious exploitation or occupation in order to protect the ecological integrity of the area. - To allow spiritual, scientific, educational, recreational and tourism opportunities, compatible with the environment. - To contribute to economic development. 	2008, 2012 (in vigour).

million km² (UNEP-WCMC, 2018), although it is Monaco and Germany that have a higher percentage protected, 100% in the case of Monaco and 45.4% in the case of Germany, albeit the protected area of Monaco is not significant. According to Batista and Cabral (2016) the increase in the number of MPAs in Europe is due to several factors, among which are the increase in scientific studies, the development of integration methods and software that optimises results and supports management decisions. On the other hand, Oceania, which has greatly expanded protection since the beginning of this century, has the second largest MPA in the world - Marae Moana (Table 1).

Other regions, such as LatC or SubAf, have significantly increased their MPAs. LatC protects the 12.58% of its national waters, due to the efforts made by Brazil and Chile with the designation of several MPAs in 2017 and 2018. (UNEP-WCMC and IUCN, 2018). According to the FAO (2012), South America is the area with the largest area of MPAs, followed by Central America, and finally the Caribbean. However, it is the latter that protects a greater percentage of its marine area. SubAf are approaching the 10% protection threshold required by the Aichi Targets by 2020. This is mainly contributed by South Africa, which in 2014 protected 174,954 km² (United Nations Statistics Division, 2017), which sees 11.3% of its waters under national jurisdiction, accounting for 57.8% of the MPAs in this region.

On the other hand, the areas that have a lower percentage of their national protected waters are ESEAs, with 3.56%, WAsNAf, with 1.11%, and CSAs, where protection does not exceed 1%. They also contribute the smallest area of MPAs. These three regions have barely increased their protection since 2000, which have remained at very low levels, especially CSAs. The Southeast Asian Fisheries Development Center promotes the adoption of an ecosystem approach to fisheries in the different countries of the region, although none have specific legislation for this purpose. However, it is being introduced through various projects and programmes. (Pomeroy et al., 2015). As indicated by Tiquio et al. (2017), in these areas most of the regional environmental programmes have a weak financial structure, leading to low implementation of policies, an inability to apply adequate management tools and a lack of personnel and teams trained to carry out studies and ecosystem monitoring.

3.2. Declaration of MPAs

Tables 2 and 3 show an example of MPA for each region. Table 2 shows those declared before 2005, the year the Millennium Ecosystem Assessment was published, promoting greater interest on ecosystem approaches. Table 3 addresses the second decade of the 21st century, a sufficient period of time to assess whether there have been changes in the declaration of MPAs since the publication of the MEA.

Prior to 2005, the main reasons that lead to the declaration of MPAs were the protection of biodiversity and fish resources. Among the objectives of almost all the chosen areas is scientific research, which highlights the need to expand knowledge regarding the marine environment. Although no major

differences have been found in the reasons that lead to the declaration of an MPA between different regions of the world, a difference in terms of the existence and application of management plans can be detected. Thus two groups are differentiated: A (NAEu, AusNZ, O and LatC) and B (ESEAs, CSAs, WAsNAf and SubAf).

In group A, the selected MPAs have a management plan and, in the case of AusNZ and LatC, this has been revised and modified with more recent versions incorporating more current conservation objectives than those indicated in Table 2. The plan for Mañagaha (O) is from 2005 and is still in vigour. In the case of the Strait (NAEu), the Natural Resources Management Plan (PORN in spanish) has indefinite validity, and has not yet been modified, like the Use and Management Master Plan (PRUG in spanish), which has not been renewed either, although its validity is between four and six years. In the conservation goals of all these spaces there is already talk of sustainable development, which is especially interesting in the cases of Galapagos and the Great Barrier Reef, since they were declared in 1959 and 1975, respectively. The MPAs of this group, with the exception of Galapagos, are located in the most developed regions of the planet.

Regarding the developing zones of group B, the main difference from group A is that almost all the selected MPAs drafted their management plans several years after declaring the area as a protected area. For example, there is no evidence of previous management in the Komodo National Park - the management plan was drafted in 2000, 20 years later than the declaration of the Park. In sub-Saharan Africa the same thing occurred, the first management plan was developed 23 years after the declaration of the National Park of the West Coast, in 2008, albeit the first revision occurred four years later. The Kutch Gulf National Park is managed by the Integrated Management Plan of the Coastal Zone, which covers the entire area of the Gulf. Its management objectives are influenced by the guidelines of the 21st century, hence an ecosystem approach began to appear. We were able to extract the reasons that led to the declaration of the most recent plans from their web page, which refer to the protection of specific species or ecosystems.

After 2010, the MPAs selected have management plans that are very recent or are still under development (AusNZ and O), meaning that no revisions have yet been made. Again, there are differences between the regions, especially in terms of access to available information. Dividing them into the same two groups, sustainability of fishing appears as an important factor in both.

In group A, an ecosystem approach is incorporated in this period. In addition to the conservation of biodiversity, the MPAs include among their goals, sustainable use of resources and economic growth of the populations that source them. Greater attention begins to be paid to the damage caused by human activities, and therefore a new common objective is included; the monitoring of the natural environment. Furthermore, new factors appear to be taken into account, such as tourism, maritime transport and the inclusion of indigenous peoples in decision-making. In the two regions of Oceania, for example, tourism is included as one of the main conservation objectives. It is a sector of great importance that is in developing rapidly, and has brought the population closer to the MPAs. In

Table 3

Examples of MPAs declared after 2010 in different regions of the planet, reasons for declaration and conservation aims.

Reasons for declaration	Conservation aims
Australia (AusNZ): Coral Sea (2012) (Director of National Parks, 2017) To protect and conserve biodiversity and other natural, cultural and heritage values, ecologically sustainable use and enjoyment of natural resources, contributing to economic growth, employment and social well-being of coastal cities and communities	Draft Document <ul style="list-style-type: none"> - To improve the awareness, understanding and support of marine parks and their management. - To provide and promote a wide range of recreation and tourism experiences, committed to the environment and contributing to the Australian economy. - To recognise and respect the indigenous culture and its responsibilities for taking care of the park, and to ensure multiple benefits to traditional users. - To provide the necessary scientific knowledge to understand the values, pressures of the park and the appropriate management responses. - To provide efficiency, effectiveness, transparent and measurable evaluations, authorisations and monitoring to ensure the sustainable use and protection of marine values. - To carry out preventive and restorative actions to protect human, natural and cultural value and heritage from human impacts.
The Cook Islands (O): Marae Moana National Park (2017) (Marae Moana Policy, 2016–2020, 2016) To conserve the biodiversity and the natural goods in the ocean, reefs and islands, while sustainable development and growth of economic interests are guaranteed.	Currently in development <ul style="list-style-type: none"> - To maintain biodiversity and restore damaged ecosystems and habitats, ensuring resilience and biological productivity, as well as ecologically sustainable use. - To eliminate fragmentation and allow for integrated planning. - To ensure opportunities creating optimal economic use of marine resources, which allows ecological sustainability and social development. - To take advantage of touristic opportunities to optimise economic use, ensuring ecological sustainability and social development. - To develop the maritime industry in compliance with international standards, ensuring safety. - To ensure transparency, collaboration and measurable management processes. - To minimize negative social impacts on marine and maritime development. - To protect cultural heritage. - To promote the participation of all parties in planning, implementation, monitoring and evaluation of management. - To educate and inform the community. - To promote a research culture. - To search for long-term sustainable financing.
Canadá (NAEu): Tarium Niryutait (2010) (Fisheries and Oceans Canada, 2013) To conserve and protect biodiversity within the MPA, and ensure the viability of a healthy population of beluga whales. It is an area traditionally used by the Inuvialuit, and of great importance from a cultural and socioeconomic perspective, which must be maintained.	<ul style="list-style-type: none"> - To strengthen and support conservation goals and objectives. - To manage human pressures so as to maintain the quality of life, including food security and the health of resources, ensuring socio-economic benefits. - To ensure that the tools and structures of the government established to manage the MPA are efficient, effective and economical.
Costa Rica (LatC): Seamounts Marine Management Area (2011) (Sistema Nacional de Áreas de Conservación, 2013) To protect and manage the diverse species that transit/habit in a series of geological structures that emerge from the depths in the exclusive economic zone of Costa Rica and that could have an important value in the attraction and grouping of marine biodiversity (It works as a buffer zone of Coco Island, although they are two different MPAs).	<ul style="list-style-type: none"> - To conserve a representative sample of the marine ecosystem, characteristic of the Coastal Submarine of Coconut. - To conserve sites of aggregation (rest, reproduction, cleaning, feeding) of species of fishing importance, both commercial and sports. - To conserve transit areas and aggregation sites for pelagic fish, cetaceans and marine turtles, especially species that are threatened and in danger of extinction. - To conserve transit areas and aggregation sites for rays, pelagic and demersal rays and blankets, and conserve areas of transit and aggregation of migratory species such as tuna and dorado. - To conserve deep coral formations. - To conserve transit areas and aggregations of seabirds.
Indonesia (ESEAs): Savu Sea (2009) (Pet, and Widolo, 2009) This region is an important navigation route, as well as a key corridor for many marine migratory species. Its coral reefs are extremely diverse and provide an important habitat for many marine species. In addition, it is a fishing zone, and supports the livelihoods and economy of coastal communities.	<ul style="list-style-type: none"> - To conserve biodiversity and protect coral reefs, deep-water habitats and their associated ecosystems. - To develop tourism and protect the resources it uses, such as corals or the open sea. - To support the pelagic and demersal fisheries of the shallow shelf, by protecting the breeding populations of commercial species. - To support sustainable livelihoods for the community.
Bangladesh (CSAs): Swatch of No Ground (2014) It is a key area for breeding and spawning for dolphins, whales, sharks and turtles	No information has been obtained
Emiratos Árabes Unidos (WAsNAF): Al Saadyat/Ras Ghanada/Eastern Mangrove (2014) No information has been obtained	No information has been obtained
Sudáfrica (SubAf): Amathole (2011) (Zolile Ngayi, 2011) To conserve biodiversity and maintain fishing reserves in good condition	<ul style="list-style-type: none"> - To protect and conserve the marine environment and the biodiversity of the region. - To provide a sanctuary for the species impacted by boat operations. - To ensure areas for scientific research and monitoring, with the aim of protecting and conserving biodiversity and the ecosystem. - To control activities that may cause degradation of habitats.

Australia and Canada, the indigenous community is included as an important factor to consider when managing the MPA.

Regarding group B, little information has been obtained on MPAs

declared after 2010. It can be stated that the majority were established in the first decade of 2000. In addition, no information on management plans has been obtained for the selected MPAs. We have been able to find the

management objectives of Savu Sea and Amathole, in scientific articles and the websites of the Ministries of the Environment. In the latter, fishing is a fundamental factor.

3.3. Trends in the management of MPAs

After analysing the current situation of the MPAs at an international level in different regions of the world and compared with the documents and literature reviewed, we find several advances with respect to the last century, among which the following stand out:

It is recognised that the MPAs are a useful tool for restoring the natural capital of the planet, and an ecosystem approach is being introduced in the management of the marine environment, with the aim of ensuring the supply of services that the oceans offer. Possibly, the Aichi Targets and the 2030 Agenda are two of the most important agreements of the last decade to conserve and sustainably use terrestrial and marine biodiversity and their associated services (UNEP-WCMC and IUCN, 2016). For this approach to be effective, it must be translated into policies at a national level (Gelcich et al., 2018), something that some countries and regions are already doing (Balgos et al., 2015). However, research is necessary that evaluates the connections between the implementation of this approach in national policies and the management plans of the MPAs, for example, through social and ecological indicators (Rodríguez, 2017; Gelcich et al., 2018).

The role of the MPAs is firmly established as a necessary instrument to re-establish climate stability. In the document “*Promise of Sydney*”, a result of the VI World Parks Congress (2014), the inclusion of MPAs within the United Nations Framework Convention on Climate Change was proposed. To date, the majority of MPAs that have considered climate change in their planning and management have done so through qualitative and conceptual declarations that are not translated into quantitatively ecologically justified objectives (Magris et al., 2014). Few approaches for planning of MPAs are based on the knowledge of directional or stochastic changes due to climate change and its effects on species and ecosystems. Hopkins et al. (2016) established that strict marine reserves (including non-extraction zones) are key to maintaining resilience and reducing the impacts of climate change.

There is evidence that protection has begun to expand beyond national waters. In 2015, the General Assembly of the United Nations agreed on a negotiation process to develop an international legal framework under the United Nations Convention on the Law of the Sea, concerning the conservation and sustainable use of marine biological diversity in ABNJ (UNEP-WCMC and IUCN, 2016). The negotiations are expected to continue until 2020.

4. Conclusions

The advances made in recent years demonstrate that the conservation of coastal-marine areas is no longer an end in itself, but has evolved towards more ambitious targets, such as the conservation of the planet's natural capital or the fight against climate change. However, most marine conservation continues to be concentrated in national waters, despite the fact that for years governments have been discussing the need to expand protective borders beyond national jurisdiction (Druel and Gjerde, 2014), due to, among other things, the increase in anthropic pressures. Recently, the expansion of MPAs towards ABNJ is taking place and at present, the legal framework for its regulation is being negotiated.

Furthermore the fact that the reasons for declaring an MPA in different parts of the world are similar, reveals that international guidelines fulfill their purpose, and all regions are moving towards a holistic management approach. However, there are differences between countries that are more developed and those that are not, especially in recent years. Starting in 2005, after the publication of MA, the ecosystem approach began to be established and concern for protection increased. The countries with greater development increased their protected areas and included objectives that go beyond the mere conservation of biodiversity, such as economic or cultural development. A clear example is the Natural Park of the

Great Australian Barrier Reef, which considers tourism as a fundamental part of its management. Another interesting case is the National Park and the Galapagos Marine Reserve, an international benchmark in terms of conservation. It is an exceptional case in which tourism has a large presence. Another important case for Latin America is Cocos Island. It is one of the last refuges for large pelagics, and is one of the best protected places, although it suffers the threat of illegal fishing (Edgar et al., 2014). It is surrounded by the seamount MPA and, although they are two different MPAs, in practice it functions as a buffer zone for Cocos Island. This shows that on many occasions the national scale is very beneficial for the creation of biological corridors. In this sense, Costa Rica has made a great effort to develop and implement conservation policies for the ocean, with the creation of the “Policies for Wildlife Protected Areas of the National System of Conservation Areas 2011–2015” and the National Policy of the Sea 2013–2028 (Moreno-Díaz, 2016). On the other hand, both Galapagos and Cocos Island have increased the area of their marine protection. Galapagos through the rezoning of the marine reserve in 2016, and Cocos Island through the declaration of the seamount MPA, despite being 2 different areas. This increase in protected area could increase the connectivity between the two MPAs, as well as protect a major part of the Eastern Pacific Marine Corridor, an area of great biological richness (Cortés, 2016). However these cases are not representative of the MPAs in Latin America. Conserving Latin America and the Caribbean is of the utmost importance, considering that they cover different types of coastal ecosystems, including coral reefs, coastal lagoons, mangroves, marshes, sandy beaches, seagrass beds, seagrasses and even fjords. In addition, its waters contribute significantly to the diversity and productivity of the planet (FAO, 2012).

Developing regions are still far from achieving these values. The economic and social situation of many of these countries is problematic, and their priorities are focused on meeting basic needs. This idea is related to one of the problems identified in the MA report, which showed that the degradation of ecosystem services is contributing to the increase of social inequalities (MA, 2005). As stated by Tiquio et al. (2017), regional policies continue to be implemented in these places, thus, stimulation of economic development is prioritised over protection. Priority being given to the most urgent internal problems, such as poverty, for which less funds for environmental concerns are assigned. On occasion, marine protected areas are declared that are not well managed, meaning that the protection of their biodiversity and resources is not guaranteed. In Southeast Asia, for example, there are large coral ecosystems that are severely threatened, including the marine region with the greatest biodiversity in the world, most of the Coral Triangle, which should be a global priority (Jenkins and Van Houtan, 2016).

It is striking that, despite international recommendations and the efforts made by governments and institutions, the oceans remain one of the ecosystems most affected by the development of human activities. The number of threats to coastal-marine systems increases (climate change, ocean acidification, overfishing, pollution, changes to coastal land uses ...) rendering it necessary to introduce urgent changes that cover different areas of action (political changes, legal, economic, social, education, cities, consumption patterns, etc.) and different levels (international, national, regional and local). The reality is that there is a marked lack of success in achieving objectives in the majority of MPA, despite numerous indications, which has led some authors to question the effectiveness of MPAs as an instrument to halt the loss of biodiversity (Jameson et al., 2002; Mora et al., 2006; Charles and Wilson, 2009). However, it is a widely used instrument, and international organisations and public institutions recognise its usefulness.

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